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Science and Fiction in Zadie Smith's *White Teeth*

Josie Gill

In 1943, long before his intervention in the two cultures controversy between C.P. Snow and F.R. Leavis, Lionel Trilling published an essay on E.M. Forster's first novel *Where Angels Fear to Tread* in which he offered a comparison of the methods of the scientist and the writer of fiction. In defence of Forster's melodramatic plots, from which, Trilling suggests, "contemporary taste draws back, insisting that life is not like that," he writes that

Plot is to the novelist what experiment is to the scientist, which is exactly what Zola did not know when he wrote his essay "The Experimental Novel"; Zola's defense of scientific naturalism in fiction has nothing at all to do with experiment. The science he had in mind as analogous to novel writing was medicine as practised by the great physician Claude Bernard; that is to say he had in mind an empirical, not an experimental science. And Zola's novelistic 'science' was a science of observation, and precisely not of experiment. He condemned plot as artificial, but experiment is artificial too – nature does not exist in test-tubes and retorts and under controlled conditions, and to conclude that what happens in the laboratory is what happens in the universe requires a leap of the imagination. But experiment, with its artificiality, is our best way of making things act so that we can learn about their nature. And plot in the novel does the same for human nature. (65)

Interviewed in 2002 about her short story *The Trials of Finch*, Zadie Smith refers to Trilling's scientific analogy as she reflects on the construction of character and plot in her own writing, coming to a similar defence of artificiality:

Real character gives itself away, I think, in the quiet moments, and, for me, it's a great effort to write the quieter bits, to not always explicate through plot. The objection, again, with Finch was this: life is not like that! But I'm still not sure what's meant by that idea. That's sort of why I'm studying the novel again. I do believe in the uses of plot – Lionel Trilling talked about it as a sort of laboratory of ideas. What happens in a lab is an artificiality that sets us up for an experience of the world. The scientist begins with a thesis he wants in some way to prove – he may not get the results he expects, but his experiment is tangential to the world, it has a place there. I think the intention is the same in fiction. ("Dreaming up Finch")

It seems likely that Smith came to Trilling's essay through her self-professed "love" of E.M. Forster, "to whom" she has stated, "all my fiction is indebted" ("Acknowledgements"). Smith has written of and, similarly to Trilling, defended Forster's melodrama, recognising its influence on her own work.¹ Following the publication of her first novel, *White Teeth* (2000), Smith was criticised for the artificiality of her style: James Wood branded the novel part of an emerging genre

which he dubbed "hysterical realism," novels characterised by improbable plots in which novelists "clothe real people who could never actually endure the stories that happen to them" ("Human, All Too Inhuman"). For Wood – espousing the kind of objection to melodrama that Trilling identifies – "they are stories which defy the laws of persuasion" ("Human, All Too Inhuman"). Smith's reflections, via Trilling, on the use of plot suggest that the 'artificial' elements of her writing are strategic and considered, rather than indicative of the out of control postmodernism that Wood considers them to be. However, what interests this article is Smith's use of scientific comparison as a means of justifying her literary craft. For what might otherwise appear as a convenient analogy takes on a more complex dimension when placed in the context of Smith's exploration of science in *White Teeth*.

This article argues that Smith interrogates the relationship between science and fiction in *White Teeth*, drawing on a Forsterian comic mode in her representation of genetics which ultimately reveals common ground between science and writing. Smith's tale of three London families, the Joneses, the Iqbals and the Chalfens, whose socially and ethnically varied backgrounds form the basis of their comic interactions, takes the new genetic science as one of its major themes: Marcus, head of the Chalfen family, is a geneticist whose experimental FutureMouse© has been designed to develop cancer and eventually die at a predetermined time - New Year's Eve 1999.² The development of his science has been possible only through the work of his predecessor and mentor Dr Perret, who is revealed to be the Nazi racial scientist who Archie Jones and Samad Iqbal had encountered during the Second World War, as Smith uncovers the often obscured connections between genetics past and present, offering what Ashley Dawson identifies as a "powerful qualification of optimistic readings of the novel forms that biopower is assuming today" (151). Yet the comic form that the novel takes – the Forsterian coincidence, irrationality, humour, melodrama and 'artificiality' through which Smith portrays science and scientists – enables Smith's engagement with science to move beyond an "inquiry into the recent past of genetic engineering" (McMann 619). *White Teeth* not only illuminates the narrative and fictional aspects of contemporary genetics, but also offers a metafictional consideration, in an extension of Trilling's analogy, of how the science it addresses might also inform the novel's construction. In so doing, Smith defends not only the novel's 'artificial' plot, but the capacity of fiction to explore and to represent science in the twenty-first century.

There has been a critical tendency to overlook the comic form of *White Teeth*, despite the fact that it was the novel's comedy which was arguably responsible for its almost instant popularity. The novel's back cover attests to the fact that Smith's humour was celebrated (and marketed) above all else: reviewers described the novel as "funny, generous, big-hearted," "swooping, funny," "relentlessly funny," "hilarious," "extremely funny" (Smith, *White Teeth*). However literary critics have focused more on articulating the postcolonial themes of the novel, on Smith's portrayal of race relations in late twentieth century London and of the inevitable hybridity and cultural mixing which the presence of immigrant populations has brought about (see: Thompson; Head; Walters). Where the novel's comedy is commented upon, it is interpreted as a tactical strategy through which Smith avoids being overtly political: for Claire Squires the comic deflation which characterises Smith's portrayals of racism works to show that racism is out-of-date (38), while for Susie Thomas, Smith's comic mode more problematically evades painful questions about race and multiculturalism ("Zadie Smith's False Teeth").

Yet Smith's comic style does not consist simply of the whimsical, the lighthearted or even the funny treatment of her subjects. Instead, it is the product of her emulation of the characteristics of the Forsterian comic novel, of which she has both written and spoken extensively. Asked in an interview about what appeals to her in Forster's work, Smith stated that "Forster represents one of the earliest loves of my reading life and the first intimations I ever had of the power and beauty of this funny, artificial little construction, the novel" ("A Conversation with Zadie Smith"). Smith identifies two characteristics of the Forsterian comic novel which have influenced her writing; the "artificial" (already touched upon, and of which more shortly) and, related to this, the "funny," which is characterised, for Smith, not only by humour but by the peculiarity, inconsistency and muddle of the human condition. She writes that:

There is a lot in Forster that fails, is both cloying and banal: his Pantheism, his fetish for the exotic, his idealisation of music. The mystic will occasionally look the fool. Forster took a risk, opening the comic novel to let in the things it was not designed for; small patches of purple prose were the result. But Forster's innovation remains: he allowed the English comic novel the possibility of a spiritual and bodily life, not simply to exist as an exquisitely worked game of social ethics but as a messy human concoction. He expanded the comic novel's ethical space (while unbalancing its moral certainties) simply by letting more of life in. ("Love, actually")

For Smith, Forster's strength lies in the fact that he "suggested there might be some ethical advantage in not always pursuing a perfect and unyielding rationality," and that he "wanted his people to be in a muddle: his was a study of the emotional, erratic and unreasonable in human life" ("Love, actually").

The influence of this Forsterian comic muddle on *White Teeth* is clear: from Samad's decision to send one of his twin sons to Bangladesh to remove him from the "corruption" (190) of English culture in response to his own affair with the twins' teacher Poppy Burt-Jones, to Archie's coin tossing to decide whether or not to commit suicide or whether to shoot Dr Perret, or Irie's decision to sleep with both twin brothers Magid and Millat within hours of each other, the novel is full of people who behave in emotional, unreasonable and funny ways. However it is arguably in her portrayal of science, and of her characters' interactions with it, that Smith's own "messy human concoction" is fully realised. For while Smith explores the implications of contemporary genetics through her depiction of Marcus's science, offering a "timely warning that the history of 'race' is by no means over" through an elucidation of the "closely interwoven utopian and dystopian potentials of the new biotechnologies" (Dawson 152, 172), she does so in a comic mode in which science is subject to the irrational and misguided interpretations of the novel's characters.

Smith makes popular misunderstandings about genetics part of the comic fabric of the novel, depicting the ways in which Marcus's genetic ideas infiltrate the thoughts of the other characters, where they become muddled and confused. Alsana's nightmare vision of the "dissolution, *disappearance*" that the immigrant fears is expressed through her comic misunderstanding of the process of genetic inheritance, her anxieties about the behaviour of her children merging with broader, cultural anxieties about the meaning of genetics:

Even the unflappable Alsana Iqbal would regularly wake up in a puddle of her own sweat after a night visited by visions of Millat (genetically BB;

where B stands for Bengali-ness) marrying someone called Sarah (aa where 'a' stands for Aryan), resulting in a child called Michael (Ba), who in turn marries somebody called Lucy (aa), leaving Alsana with a legacy of unrecognizable great-grandchildren (Aaaaaaa!), their Bengali-ness thoroughly diluted, genotype hidden by phenotype. (327)

Cultural, racial and genetic forms of inheritance become conflated in a kind of reductionism that Judith Roof has identified as characterizing popular understandings of DNA: "When we imagine genes as agents, they become literal representatives of our bodies, our wills, and our desires. We become our genes and our genes become us, so that we imagine that we, too, somehow survive from generation to generation" (Roof 149). Millat's attempt to shoot Dr Perret at the end of the novel comically becomes a mission determined by his genetic inheritance from his revolutionary great-great-grandfather Mangal Pande; "His is an imperative secreted in the genes and the cold steel inside his pocket is the answer to a claim made on him long ago. He's a Pandey deep down. And there's mutiny in his blood" (525). The genes become the ultimate carriers of historical meaning, history is "made to appear materially in the present, carried with us always [. . .] We are what we are because they were who they were" (Roof 201). Patterns of behaviour are repeated from generation to generation, the past lives on in the present, through the genes. Thus Samad's "sins" – his affair with Poppy – will be passed on to his sons "stored up in the genes" (161), while the Chalfens comically consider the success of their extended family in terms of the "*good genes* which were so often referred to" (314). In an analysis of film comedies about science, Roof suggests that "science comedies take over and amplify cultural beliefs as part of their generic working. Popular misconceptions about science become part of the stuff of the comedy so that comedies are much more symptomatic readings of myth than more 'serious,' or even fantasy, genres might be" (17). Such an amplification of cultural belief is evident in the comic misconceptions of genetics presented in *White Teeth*: making science the stuff of comedy and, specifically, the stuff of the comic novel, Smith uncovers the myths about genetics which circulate in contemporary culture.

Yet the novel suggests that science itself is part of the human muddle and mocks the attempts of scientists to extricate themselves from the unreasonable and irrational human behaviour which contributes to such popular misinterpretations of their science. Marcus, explaining his FutureMouse© experiment to Irie, emphasises the precision, predictability and rationality of his science, everything that the novel's muddled and impassioned characters are not: "if you *re-engineer* the actual genome, so that *specific* cancers are expressed in *specific* tissues at *predetermined* times in the mouse's development, then you're no longer dealing with the *random*. You're *eliminating* the random actions of a mutagen" (340). However, no amount of explaining can prevent the public's misunderstanding of his work. Waiting for Magid at the airport Marcus encounters an Asian girl reading his popular science book, whose interpretation of his science, "where are we going here? Millions of blonds with blue eyes? Mail order babies? I mean, if you're Indian like me you've got something to worry about, yeah?" (418) leaves him bemused;

It was exhausting just to listen to her. Nowhere in the book did Marcus even touch upon human eugenics – it wasn't his field, and he had no particular interest in it. And yet this girl had managed to read a book almost entirely concerned with the more prosaic developments in recombinant DNA – gene

therapy, proteins to dissolve blood clots, the cloning of insulin – and emerge from it full of the usual neo-fascist tabloid fantasies. (418-419)

What might otherwise be a sympathetic portrait of a scientist struggling to communicate the truth of his science is undermined, however, by the fact that in his desire for a straightforward and rational understanding of his science, a desire reflected in the design brief for the “white/chrome/pure/plain [. . .] uncontaminated cavity” (518) of the Perret Institute, Marcus has ignored the truth of his science’s history; the fact that his work on FutureMouse© is the direct result of the racial scientific research of the Nazis. Dr Perret’s photograph hangs on Marcus’s wall alongside those of Watson and Crick, and at the launch of FutureMouse© at the Perret Institute, Marcus describes his mentor as “elemental and inspirational. Not only is he a personal inspiration, but he laid the foundations for so much of this work” (531). The racial aspects of Perret’s science have become obscured in the present, their trace to be found only in small details, in the fact that FutureMouse© is programmed to lose its pigmentation and turn from brown to white, and in the ironically blank yet racialised space of the Perret Institute, which is “pared down, sterilised, made new every day by a Nigerian cleaning lady with an industrial Hoover and guarded through the night by Mr DeWinter, a Polish nightwatchman” (518). Science, Smith suggests, cannot exist in an empty, purified space, separate from the complexities and entanglements of its history; it is, unavoidably, part of the popular interpretations the public attribute to it, part of the unreasonable in human life that the comic novel strives to represent.

The implications of this stance are not lost on Smith. Making scientific rationality and truth the stuff of comedy and demonstrating that the ‘irrationality’ of science is something which literature is in position to uncover, the novel presents what could be deemed a typically literary or deconstructive view of science, of the kind objected to by scientists during the culture wars of the 1990s.³ Smith tackles this issue head on by satirizing the incomprehension of scientists toward literary studies of their work and thus self-consciously addressing the status of her own novel as a literary representation of scientific endeavour. Marcus consistently identifies literature as the antithesis of scientific rationality and reason, the Chalfens espousing a traditional belief in ‘the truth’ which, for them, is the opposite of humanistic study:

If you were arguing with a Chalfen, trying to put a case for these strange French men who think truth is a function of language, or that history is interpretive and science metaphorical, the Chalfen in question would hear you out quietly, then wave his hand, dismissive, feeling no need to dignify such bunkum with a retort. Truth was truth to a Chalfen. (312)

For Marcus, science and fiction have little to say to each other, “science and science fiction were like ships in the night, passing each other in the fog” (417). His popular science collaboration with the novelist Surrey T. Banks is a “split level high/low culture book, whereby Marcus wrote a ‘hard science’ chapter on one particular development in genetics and then the novelist wrote a twin chapter exploring these ideas from a futuristic, fictional, what-if-this-led-to-this point of view, and so on for eight chapters each,” motivated purely by “pecuniary reasons” (416). Factual, high-culture science is pitted against fiction, which is culturally “low,” as Smith pokes fun at both Marcus’s polarised view of the two cultures and her own portrayal of genetics, as the novel itself becomes the target of Marcus’s objection to the “great ocean of idiots, conspiracists, religious lunatics, presumptuous novelists, animal-rights activists,

students of politics, and all the other breeds of fundamentalists who professed strange objections to his life's work." (417-418). Perhaps anticipating a criticism of the novel that never actually materialised,⁴ Smith acknowledges the limitations of novelists' attempts to represent complex scientific ideas, something of which she was conscious when writing the novel: Christina Patterson, interviewing Smith, reports that Smith "read one 'incredibly boring' book about onco-mice and cancer genes in mice and talked to 'a lot of bright friends' in order to write the scientific stuff, but is still, with characteristic modesty, convinced that the science in the book is 'incredibly bad'"(9).

Yet the novel demonstrates that its own literary, comic representation of science has value by showing that, contrary to Marcus's view, science has similarities with fiction, and the novel's inevitable representation of partial, plural and multiple truths about science simply reflects the fact that science itself consists of both the truthful and the fictional. Smith thus rejects the idea put forward by Magid when he writes to Marcus, that "when you delve into the mysteries of inherited characteristics, surely you go straight to the soul of the human condition as dramatically and fundamentally as any poet, except you are armed with something essential the poet does not have: the truth" (366). Smith would not disagree with Magid's characterization of the literary as being inaccessible to a singular truth: she has written of writers' ability to "speak simultaneous truths" ("Speaking in Tongues" 145),⁵ and has said that the aim of her writing is "truth without generalization, without cliché, and without simplification — which is almost impossible. But that's the nice thing about the novel. The aim is way out of everybody's reach, so you keep on writing them just in case" ("A Writer's Truth"). Indeed the status of writing as a source of 'the truth' is questioned everywhere in *White Teeth*: Irie, "sick of never getting the whole truth" (379) turns to her grandmother's schoolbooks from Jamaica to try to discover the truth of her heritage, but the colonial books she reads — "*Dominica: Hints and Notes to Intending Settlers*" and "*In Sugar Cane Land*" — give her a false picture of "dashing Capt. Durham" (400), the Englishman who impregnated her great-grandmother Ambrosia Bowden. The history of Glenard Oak School is reconstructed inaccurately through a booklet written by the PTA, who decide to remember the school's founder, Edmund Glenard — the English colonialist who tried to rape Ambrosia — as "their kindly Victorian benefactor" (303). Samad is incensed by the way historians have written of his great-grandfather as a drunkard rather than a revolutionary, "the truth mutating, bending, receding" (255).

Smith demonstrates, however, that this might also be a description of science, which frequently takes narrative and fictional forms that disrupt any straightforward access it may claim to 'the truth'. Marcus ironically recognises the slippery nature of narrative as a source of 'the truth' when he dismisses the Iqbals' history, "'A great revolutionary. So I've heard. I wouldn't take any of that seriously, if I were you. One part truth and three parts fiction in that family, I fancy'" (339), yet is unable to recognise that his science is also part truth and part fiction. The boundaries between science and fiction are certainly more porous than Marcus is willing to admit: when Irie reads the FutureMouse© press release to a journalist, "Though she had repeated the words many times, they still seemed fantastical, absurd — fiction on the wings of fantasy — with more of a dash of Surrey T. Banks in them" (431). The communication of science to the public relies on the use of narrative, but this imaginative strain also becomes part of the science itself. Marcus inadvertently hints at this when he contradicts his earlier assertion about science fiction when introducing Dr Perret, whom he describes as "pushing the envelope, when work in this area was seriously underfunded and looked to remain in the realms of science fiction" (531). However it

is through FutureMouse© itself that his science becomes fiction: the hyperbolic promotion of FutureMouse© means that it becomes, in the public's eyes, a version of the cartoon character Danger Mouse, the mouse is a "*cartoon* of an idea" where "one expected the damn mouse to stand up and speak by itself" (431). Roof has argued that "representations of science render scientific facts less 'true' (or more culturally relative) while the figures of their representation become scientifically operative" (23). This is a paradox which *White Teeth* goes some way to uncovering: the science behind FutureMouse© is elided by the mouse itself, the mouse transformed into a fiction, which then becomes a kind of truth, as the novel ends with FutureMouse© escaping, Danger Mouse style, from its display case at the Perret Institute.

Suggesting points of similarity between Marcus' genetics and the fictional, Smith not only offers a comment on what happens to science in culture, on the two way traffic (to borrow Beer's phrase) between science and the representation of science, but also draws attention to the relationship between the novel itself and the science which it represents. If the comic novel conveys a Forsterian "messy human concoction" ("Love, actually") it does so, for Smith, through its portrayal of irrational, messy characters and, in the case of *White Teeth*, the entanglement of those characters with an equally unreasonable science. However the comic novel is also characterised by its artificial form: writing of Forster's muddled characters, Smith states that "what interests me is that his narrative structure is muddled also; impulsive, meandering, irrational, which seeming faults lead him on to two further problematics: mawkishness and melodrama" ("Love, actually"). As the introduction suggested, both Smith and Trilling recognise that Forster's plots, which consist of "all the old devices of recognition scenes, secrets, letters that prove something, stolen babies, destroyed wills, long-lost brothers, hidden sins, shocking revelations and even physical conflict" (Trilling 65), tend to melodrama, leaving his writing open to the charge of artificiality. Yet such artificiality of plot is justified, and has value, because it is the novelist's way of examining human nature, "of making things act so that we can learn about their nature" (Trilling 65), in the manner of a scientist. Trilling's comparison between scientific experiment and novelistic plot is a means of defending Forster's art but in *White Teeth* it becomes a means for Smith to further interrogate the relationship between science and the (comic) novel. For while Smith considers the ways in which science is like fiction, she also imagines how fiction is like science.

The artificiality and melodrama of the plot of *White Teeth* cannot be disputed. James Wood incredibly summarises what is arguably the novel's most melodramatic point – its ending – thus, "*White Teeth* ends with a clashing finale, in which all the novel's characters – most of whom are now dispersed between various cults and fanatical religious groups – head toward the press conference which the scientist, Marcus Chalfen, is delivering in London, to announce the successful cloning of his mouse" ("Human, All Too Inhuman"). The finale connects all of the novel's groups and characters together improbably in the same place, to which Smith adds the shocking revelations, recognition scenes and physical conflict of the Forsterian novel: Archie recognises Dr Perret as the Dr Sick whom he failed to kill during the war, Samad realises Archie's lie, Millat tries to shoot Dr Perret and FutureMouse© escapes. The muddle is complete, resolved with further, unresolvable muddle: it is unclear to the authorities which twin is responsible for the shooting, while it is also unclear which is the father of Irie's baby, a plot device too far for Wood; "Near the end of *White Teeth*, one of the characters, Irie Jones, has sex with one of the twins, called Millat; but then rushes round to see the other twin, called Magid, to have sex with him only moments after. She becomes pregnant; and she will never know which

twin impregnated her. But it is really Smith's hot plot which has had its way with her" ("Human, All Too Inhuman").

However Smith's "hot plot," like Forster's "hot melodrama" (Trilling 65) is more controlled than Wood imagines it to be. Smith self-consciously turns her plot into part of the experiment around which it revolves. In a kind of literalisation of Trilling's analogy, Smith imagines the manoeuvring of her characters through plot as a scientific experiment, inviting the reader to recognise the novel as a fiction, as artificially constructed and contrived as Marcus's FutureMouse©. Smith gestures towards this at various points in *White Teeth* where the novel's fictive, constructed nature is made explicit. For example, when Irie is employed by Marcus to organise his filing cabinet, and is arranging the letters between Marcus and Magid she "split the filing system in two, choosing to file by author primarily, then chronologically, rather than let simple dates rule the roost. Because this was all about people. People making a connection across continents, across seas" (365). This is how Smith has structured each of the novel's four sections – by character and date, two dates for each section: Archie 1974, 1945; Samad 1984, 1857; Irie 1990, 1907; Magid, Millat and Marcus 1992, 1999. That the novel is organised in the same way as Marcus's filing cabinet is funny, but it also draws attention to the possibility of an experimental exchange between what science does and what the novel does, an idea Smith develops more fully at the novel's end, where she imagines, in the manner of a scientist or social scientist, how people would react to the scene at the Perret Institute. Although initially referring to the imaginary "focus group" which has chosen the décor of the institute, the people Smith imagines as wanting to know about different strands of the plot become her readers, as Smith reveals how they too have been subject to the novel's experiment:

And there is surely a demographic pattern to all those who wish to see the eyewitness statements that identified Magid as many times as Millat [. . .] And it is young professional women aged eighteen to thirty-two who would like a snapshot seven years hence of Irie, Joshua and Hortense sitting by a Caribbean sea [. . .] And it could be that it is largely the criminal class and the elderly who find themselves wanting to make bets on the winner of a blackjack game [. . .] It would make an interesting survey (what kind would be your decision) to examine the present and divide the onlookers into two groups: those whose eyes fell upon a bleeding man, slumped across a table, and those who watched the getaway of a small brown rebel mouse (541).

The Perret Institute is transformed into a kind of laboratory in which, as with the design and engineering of FutureMouse©, there is "no question about who was pulling the strings" (489): Smith has, like a scientist in the lab, engineered the scene to see what results she gets, creating "an artificiality which sets us up for an experience of the world" ("Dreaming Up Finch").

The 'scientific' aspects of Smith's plot are also evident in the novel's emphasis on cause and effect. Marcus demonstrates complete mastery over FutureMouse© by being able to determine how and when the mouse will die; he creates "mice who year after year expressed more and more eloquently Marcus's designs [. . .] planting instructions and imperatives in the germ line to be realised in physical characteristics. Creating mice whose very bodies did exactly what Marcus told them." (312). His science is characterised by examining the consequences of actions in time, as he explains to Irie, looking at photos of the mouse with a progressively bigger tumour in

each picture, "what you really want to know is how a tumour progresses in *living tissue*" (339), "I plant a cancer and a cancer turns up precisely when I expect it" (341). Marcus's science is based on predictability and precision, on being able to determine exactly how a tumour will progress in time, a precision which the novel undermines in its emphasis on the unpredictable and the irrational. Yet it is such causality which gives structure to the novel's melodramatic plot. For Trilling, the Forsterian plot "represents the novelist's interest in causality" and "because it is concerned not only with states of being, but with consequences, gives the greatest reality to social forces" (Trilling 65, 66). Smith accords a similar importance to causality, writing that "It seems that if you put people on paper and move them through time, you cannot help but talk about ethics, because the ethical realm exists nowhere if not here: in the consequences of human actions as they unfold in time, and the multiple interpretive possibility of those actions. Narrative itself is the performance of that very procedure." ("Love, actually").

The plot of *White Teeth*, like Marcus's FutureMouse©, consists of the consequences of actions as they unfold through time: Archie, having saved Dr Sick during the Second World War, is not only destined to save him once again at the Perret Institute but his actions enable the rest of the plot to unfold in the existence of Marcus, his science and the relationship between Archie's daughter, Irie, and the Chalfen family. The consequences of Archie's coin flipping resonate throughout the novel, his predictable fate underscored by the repeated mantra that "Every moment happens twice: inside and outside, and they are two different histories" (360, 532). Of course the uncertainty of repetition, the possibility of difference in the predictably repeated which this phrase encapsulates, is what makes the novel different to Marcus's science: Marcus' concern to "eliminate the random" (341) allows no room for chance, whereas Smith recognises, as Alsana does when she understands that Magid (having been sent to Bangladesh) is more English than Millat, that "you can't plan everything" (289). An element of chance must also be factored into the plot, hence the escape of FutureMouse© at the end of the novel, and the fact that Archie's decisions rest on the toss of a coin. Trilling writes that "One thing to say is that certain kinds of unmotivated events in fiction represent what happens in life. Life is not only a matter of logic and motivation but of chance. The storyteller may – perhaps should – suggest this element of life" (Trilling 64). *White Teeth* celebrates chance, placing it in opposition to Marcus's scientific rationalism, but at the same time Smith self-consciously demonstrates that such chance is part of the artificial and constructed nature of the novel's plot and is, in this sense, comparable to the artificial experiments of the scientist (Marcus) in the laboratory.

In articulating the ways in which the novelist's engineering of plot is comparable to a scientist's engineering of a mouse, Smith moves beyond a defence of melodrama, beyond Trilling's analogy, to consider what writing about science entails, which, the novel suggests, is a degree of reciprocity: in uncovering the fictional qualities of genetics as part of her wider critique of science's claims to rationalism, objectivity and neutrality, the novelist must also reflect upon her own claims to represent human messiness, the irrational, unreasonable and uncertain. Smith demonstrates that the fictional representation of the messy human concoction requires a degree of artificiality and, by making the novel's fictive, constructed nature explicit, reminds readers that what the novel does is only another form of what science does – both are practices which artificially test and experiment with (human) nature. In this sense Smith sheds a more considered light on the genetic engineering and creation of artificial beings which have so captured the public's attention, resulting in the kinds of

fears which are comically depicted in *White Teeth*: such engineering, the novel suggests, is only another form of the artificial construction of the real that the novelist is engaged in. This move is indicative of the kind of metafictional reflex which Patricia Waugh has argued is evident in contemporary fictional explorations of science; "as science has crept increasingly onto the public agenda, the earlier metafictional energies of the novel in the 1970s have been revived and turned inwards again towards an interrogation of the relative epistemological status and value of the understanding of life, the 'stories' offered by scientists, on the one hand, and humanistic understanding on the other" ("Science and Fiction in the 1990s" 65). Reflecting on the stories told by science through an examination of its own forms of storytelling, *White Teeth* demonstrates that the contemporary novel does more than simply explore scientific ideas in the manner of Marcus's collaborator Surrey T. Banks, "from a futuristic, fictional, what-if-this-led-to-this point of view" (416). It does examine the claims, forms of representation and cultural reception of contemporary science, but also thinks through its own relationship to the science which it represents. The novel would thus seem to throw Dominic Head's claim about contemporary fictional responses to science into doubt:

The dominant transnational forces of globalization are promoted through developments in science and technology, and this has become an area of human experience that is especially difficult for the novel to register. To engage with rapid technological change, an instantaneous response is demanded, and this is beyond the capabilities of a literary form that is, rather, cumulative in its procedures of reflection and commentary. (233-234)

White Teeth not only registers the rapid developments which led to the completion of the human genome sequence in the year of its publication, exploring the cultural impact of the public prominence of genetics, but Smith demonstrates that the novel's form, far from being the cumulative commentary to science's rapidity, is a reflexive form with the capacity to suggest points of confluence between science and fiction, and to shed light on both practices at the beginning of the twenty-first century.

Notes

1. Smith states in the same interview that "I know that I tend toward melodrama and caricature" ("Dreaming up Finch").

2. The climatic denouement of the novel at the Perret Institute, where FutureMouse© is set to be revealed to the world, echoes the millennial hype surrounding the race to complete the Human Genome Project in 1999, while FutureMouse© itself is inspired by Oncomouse, a genetically modified mouse susceptible to contracting cancer which was created and patented by Harvard scientists in the 1980s.

3. Patricia Waugh provides a succinct account of how the questioning of scientific knowledge at the end of the twentieth century led to "constructivist claims that objectivity and rationality are culturally produced systems, that science cannot arrive at knowledge of a mind-independent natural reality, that its methods are always relative to shifting and heterogeneous theoretical frameworks, and that the 'objects' of scientific knowledge are therefore as 'intentional' as those of a literary text...In other words, scientific knowledge and language are no more exact than aesthetic knowledge and language." ("Revising the Two Cultures Debate" 40).

4. On the contrary, geneticist Dimitris Kioussis, reviewing the novel, claimed that "Smith has researched her subject and transferred it to paper without misinterpretations and with a remarkable accuracy and clarity for those who are not involved in or have not been taught science" and praised the novel's "flawless description of the scientific background and its potential" ("Don't Shoot the Scientist!").

5. In this case the writer Smith has in mind is Shakespeare.

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